IN THE U.S. PATENT AND TRADEMARK OFFICE

Appellants:	Narayan L. GEHLOT et al.
Application No.:	10/628,206
Art Unit:	2683
Filed:	July 29, 2003
Examiner:	Ariel A. Balaoing
For:	METHODS AND DEVICES FOR SEAMLESSLY CHANGING PROTOCOLS IN A MOBILE UNIT
Attorney Docket No.:	129250-000928/US

APPLICANT'S BRIEF ON APPEAL

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July 19, 2006

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APPELLANT'S BRIEF ON APPEAL

I. REAL PARTY IN INTEREST:

The real party in interest in this appeal is Lucent Technologies Inc. Assignment of the application was submitted to the U.S. Patent and Trademark Office and recorded at Reel 014339, Frame 0419.

II. RELATED APPEALS AND INTERFERENCES:

There are no known appeals or interferences that will affect, be directly affected by, or have a bearing on the Board's decision in this Appeal.

III. EVIDENCE SUBMITTED UNDER CFR 1.130, 1.131, OR 1.132:

None.

IV. DECISIONS RENDERED BY THE COURT OR THE BOARD IN RELATED APPEALS AND INTERFERENCES:

None.

V. STATUS OF CLAIMS:

Claims 1, 3-13 and 15-24 are pending in the application, with claims 1, 13, 18, 23 and 24 being written in independent form.

Claims 1-24 remain finally rejected under 35 U.S.C. §103(a). Claims 1, 3, 5-12, 18, 19, 21 and 22 are being appealed.

VI. STATUS OF AMENDMENTS:

A Request for Reconsideration ("Request") was filed on February 27, 2006. In an Advisory Action dated March 15, 2006, the Examiner stated that the Request was considered; however, the Request did not place the application in condition for allowance. The Examiner also (incorrectly) indicated that

Appellant's amendments to the claims raised new issues and, therefore, did not enter the amendments.

The Appellants respectfully submit that all of the features that were placed into the independent claims in the Request came from dependent claims almost verbatim.

This fact notwithstanding, the Examiner states in the Advisory Action that: "As amended, all received signals representing the location of the mobile device are now based on GPS data." However, even before Appellant's amended the claims in their Request all of the received signals representing the location of a mobile were based on GPS data. More specifically, prior to the amendment in Appellants' request the relevant part of independent claim 1 read as follows:

> "1. A method for operating a mobile unit., comprising the steps of:
> determining a future location coordinate of a mobile unit based on GPS data....";

and dependent claim 2 read:

> "2. The method of claim 1, further comprising......
> receiving signals representing a location and corresponding time coordinate of the mobile unit;
> determining a path of motion of the mobile unit based on the received signals; and
> determining the future location coordinate based on the path of motion."

Thus, as presented before the amendment in Appellants' Request, the only reasonable interpretation of claims 1 and 2 is that the future location of a mobile unit based on GPS data derived from received location and time co-ordinates *is that the received co-ordinates themselves are GPS-based.*

Nonetheless, to further place the claims in condition for allowance Appellants have deleted the amendments contained in the Request (see amendments to the claims contained in Appendix I). Further, Appellants have placed features from claims 4 and 2 (i.e., the determination of a future co-ordinate based on a path of motion) into claim 1.

Appellants have also amended claim 18 to: (a) include features that existed prior to the Appellants' Request; and (b) features from claim 20.

Appellants have cancelled claims 4, 13-17, 20, 23 and 24 because their subject matter appears to be included in one or more claims that remain in the application.

Entry of the amendments included herein is requested because the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) does not raise any new issues regarding further search and/or consideration; (c) does not present any additional claims without canceling a corresponding number of finally rejected claims; and (d) places the application in better form for appeal.

Accordingly, the arguments presented herein presume that the so-amended claims included herein will be entered. Appellants reserve their right to revise their arguments if the Examiner does not enter the amendments, including their right to Petition the Commissioner to obtain entry of the amendments.

It is the Appellants' understanding that any Petition they may need to submit will be decided substantially before the issues involved in this appeal are presented to the Board for review.

VII. SUMMARY OF CLAIMED SUBJECT MATTER:

(i) Overview of the Subject Matter of the Independent Claims

Problems associated with so-called "look back" techniques may be avoided in accordance with the principles of the invention by determining an expected, future location of a mobile unit, and selecting a prescribed protocol based on the determined future location. Advantageously, the mobile unit can anticipate and prepare for handoffs between base stations corresponding to different types of networks based on the mobile unit's present and future location. Such a technique can be referred to as a "look ahead" technique.

In accordance with an aspect of the invention, a path of motion for the mobile unit is determined by, in part, reference to a historical database. Thereafter, a "future location coordinate" is predicted based on the path of motion and/or GPS data.

By knowing the coordinate of where a mobile unit is going to be the unit can properly prepare for a handoff that requires it to operate according to a different protocol before the handoff is actually completed. Such preparation can allow the mobile unit to switch its operations from one protocol to another seamlessly, i.e., without causing a data session to be dropped (see for example, specification, pp. 2-3).

(ii) Additional Text from the Specification in Support of the Claims

In accordance with an aspect of the invention, a mobile unit conducts a data session by communicating with a remote host or server using one or more different communication networks, each type of network requiring the mobile unit to operate according to a different protocol. The mobile unit may be

equipped with Global Positioning System (GPS) receivers to receive and record location and time coordinates obtained from a GPS satellite.

For example, FIG. 1A (Appendix B) illustrates a mobile unit 20, which receives and extracts GPS data, including location and time coordinates, from data transmissions received via pathway 35. FIG. 1A also illustrates a serving base station 10-1 belonging to one type of communication network (for example, a Wavelan), and another non-serving base station 10-2 belonging to another type of network (e.g., GSM).

While FIG. 1A illustrates only one non-serving base station 10-2, there may be a plurality of non-serving base stations (which will be collectively referred to herein as "10-2") to which the mobile unit 20 may be handed off. These non-serving base stations 10-2 may correspond to a plurality of different types of networks, including but not limited to, cellular networks, Wavelan (including both IEEE 802.11 based networks and Bluetooth systems), existing and currently evolving third generation (3G) networks, and Bluetooth personal area networks (PANs).

The base stations 10-1, 10-2 of the wireless communication system may be stationary and fixed at their respective locations. Accordingly, the mobile unit 20 can identify each base station 10-1 and 10-2 according to the location coordinates extracted from the time-space vector transmitted by the corresponding base station. As shown in FIG. 1A, base stations 10-1 and 10-2 may respectively receive GPS signals via pathways 37 from the GPS satellite 30.

Alternatively, the wireless system may include base stations 10-1, 10-2 that are not stationary. In military applications, for instance, wireless communications can be facilitated in the field through the use of base station towers (antennas) carried on the back of trucks. FIG. 1B (Appendix C) is a schematic diagram, which differs from FIG. 1A in that it illustrates non-stationary base stations 10-1 and 10-2 (see specification, pp. 2-3).

In U.S. patent application Ser. No. _____, entitled "Methods and Systems for Controlling Handoffs in a Wireless Communication System Using Time-Space Vectors," which is filed concurrently herewith and whose contents are incorporated herein by reference in its entirety, there are disclosed techniques by which a mobile station 20 can be handed off between a serving base station 10-1 and a chosen non-serving base station 10-2 based on time-space vectors transmitted between the mobile unit 20 and the base stations 10-1 and 10-2. A description of these time-space vectors is given below.

Referring to FIG. 1A, the mobile unit 20 may transmit a time-space vector, which includes time and location information obtained from the GPS signal transmitted via pathway 35, to a serving base station 10-1 corresponding to a first type of network and another non-serving base station 10-2 using data transmission pathways 12-1 and 12-2, respectively.

Furthermore, each of the base stations 10-1 and 10-2 may be capable of receiving GPS signals via pathways 37, and transmitting a time-space vector to the mobile unit 20 via pathways 12-1 and 12-2, respectively.

As used herein, the term "time-space vector" refers to a set of location and time coordinates, and should not be construed as requiring a particular data format for combining these coordinates.

For example, the location coordinates of a time-space vector may use a three dimensional (3D) coordinate system to represent a longitudinal position, a latitudinal position, and a relative height above sea level. In an exemplary embodiment, the coordinate system may be Cartesian, i.e., rectangular (x, y, z). However, it should be noted that the time-space vector may use other known coordinate systems, e.g., cylindrical, spherical, and two-dimensional (2D) systems. See for example, "Introduction to Modern Electromagnetics" by Carl H. Durney and Curtis C. Johnson (hereinafter "Durney and Johnson"), pp. 10-11, section 1.4, published by McGraw-Hill, Library of Congress Catalog Number 69-13605.

The vectors may be processed using a number of different techniques to generate various values associated with, or representative of, the vectors. See for example Durney and Johnson, pp. 39-65 (magnitude, vector gradient, divergence, curl, derivatives or integrals).

The location coordinates in a time-space vector may represent a location within an area grid having a pre-defined granularity. For example, a Cartesian (x, y, z) grid may be assigned to define regions within a particular area (e.g., city or state), such that the grid coordinates are separated by a pre-defined distance (e.g., 5 meters).

The time information of the time-space vector may include a time coordinate representing the time at which the corresponding GPS signal was received. For example, the time coordinate may be generated by a Cesium clock aboard the GPS satellite 30.

The time-space vectors may be transmitted between the mobile station 20 and the base stations 10-1 and 10-2 by utilizing preamble bits, or any free bits, in data packets being transmitted between these devices via pathways 12-1 and 12-2. The time-space vector may alternatively be transmitted using a separate pilot tone, or using a separate channel superimposed on the basic signal channel of pathways 12-1 and 12-2. (see specification, pp. 3-5)

For the purposes of illustration in connection with the following disclosure, a time-space vector will be represented as including location coordinates x, y, and z, and a time coordinate t. For example, in FIGS. 1A and 1B, the mobile unit 20 is shown as being located at a position (X.sub.m, Y.sub.m, Z.sub.m). Thus, the time-space vector transmitted by the mobile unit would be represented as (X.sub.m, Y.sub.m, Z.sub.m, T.sub.m), where T.sub.m represents the time of transmission.

The serving base station 10-1 may use the time-space vectors received from the mobile unit 20 via pathway 12-1 to determine whether a handoff is appropriate. For example, using the location coordinates (X.sub.m, Y.sub.m,

Z.sub.m), the serving base station 10-1 may use a database that maps the coverage area of each of the set of base stations 10-1 and 10-2 within a particular area.

Accordingly, the database may divide a particular area into different regions, and designate a base station 10-1, 10-2 that provides the best service for that region (i.e., designate that region as the coverage area for a particular base station 10-1, 10-2). For example, the coverage area of each base station 10-1, 10-2 may include the region in which the base station 10-1, 10-2 provides the highest signal strength and/or the best service quality (e.g., the lowest call drop rate). The region corresponding to each base station's 10-1, 10-2 coverage area may also be determined based on the presence of geographical obstacles and or environmental conditions that may affect service quality for the base station 10-1, 10-2, e.g., by causing multipath reflections or the like (see specification, p. 5).

The database may further associate each region with a particular protocol (or protocols) supported by the base station 10-1, 10-2 to which the region is mapped. Thus, the database may be referred to as a "protocol database." For example, if the serving base station 10-1 belongs to a Wavelan network, the protocol database will associate the region corresponding to serving base station's 10-1 coverage area with a Wavelan protocol. The coverage area of a non-serving base station, which is connected to a GSM network, will be associated with the GSM protocol in the database.

The protocol database or portions thereof can be maintained and updated using any server(s) or data processing system(s) located at a base station 10-1 or 10-2, a mobile switching center (MSC), an application server, or any other component(s) and subsystem(s) of one or more of the networks whose base stations 10-1 and 10-2 are covered in the database. The protocol database may also be maintained as a plurality of databases (collectively referred to herein as the "protocol database"), which are maintained at different entities or

different locations. Alternatively, the protocol database may be maintained in a standalone entity, or stored in the mobile unit 20 itself, e.g., in an application specific integrated circuit (ASIC) or the like.

FIG. 3 (Appendix E) is a flowchart illustrating a technique for operating the mobile unit 20 to seamlessly switch between different protocols during a handoff. The mobile unit 20 may initially be operating according to a protocol chosen at power-up by performing a lookup in a database (this step not shown). Alternatively, the initial selection of a protocol may be pre-programmed, or made by another known technique.

In step S310, the mobile unit 20 receives GPS signals including a location and corresponding time coordinate, which represent the location and the time at which the GPS signals are received by the mobile unit 20.

In step S320, the mobile unit 20 may use one or more sets of corresponding GPS location and time coordinates to determine a path of motion along which it is traveling.

The mobile unit 20 may receive a plurality of GPS signals representing a plurality of locations visited by the mobile unit 20, along with the corresponding times at which the mobile unit 20 arrived at each location. Using techniques known within the art, a direction of movement and velocity can be calculated for the mobile unit 20. The calculated location and velocity, along with the current location of the mobile unit 20 (as determined from GPS signals) are collectively referred to as the mobile unit's 20 path of motion (see specification, p. 6).

Alternatively, historical data can be used to determine the mobile unit's 20 path of motion. Such an embodiment is useful where a user regularly takes his mobile unit 20 along the same path of motion at roughly the same time on a daily, regular, or periodic basis. For example, the user may take the mobile unit 20 along the same route when she goes to work each day, and when she returns home. Therefore, the mobile unit 20 will receive a set of GPS signals,

whose location and time coordinates are roughly the same, each time she takes one of these trips.

Such historical data can be stored, for example, in a historical database. Thus, based on the current location of the mobile unit 20 and the current time, the mobile unit 20 may be able to determine an expected path of motion, i.e., the direction and velocity at which the mobile unit 20 is expected to travel. Alternatively, the mobile unit 20 may only need the current time to determine its expected path of motion (e.g., the path it normally travels at this time each day) from the historical database. Such a historical database may be maintained, for example, by the same component or entity that maintains the protocol database. Alternatively, such historical data may actually be programmed into the mobile unit, e.g., by the mobile user using known techniques.

Continuing in step S330, the mobile unit 20 determines its current location based on the received GPS signals. The mobile unit's 20 current location may be used to determine a present region in the protocol database where the mobile unit 20 is currently situated. The mobile unit 20 may send a time-space vector to the base station 10-1, 10-2, or other component, which stores and maintains the protocol database (see specification, p. 7).

The present region generally corresponds to the coverage area of the base station 10-1 currently serving the mobile unit 20. However, this may not always be the case; for example, the base station 10-1 may decide to handoff the mobile unit 20 because of service quality, traffic load, environmental conditions, or other conditions that arose after the protocol database was last updated.

In step 350, the protocol database is used to determine a future location coordinate for the mobile unit 20 based on the mobile unit's 20 current location and its determined path of motion. The future location coordinate can represent a location to which the mobile unit 20 is heading, where the mobile

unit 20 is likely to be handed off. In particular, the future location coordinate can represent a boundary between the present region (corresponding to the serving base station's 10-1 coverage area) and an adjacent region (corresponding to another base station's 10-2 coverage area).

For example, if the path of motion indicates that the mobile unit 20 is moving in an eastward direction, step 350 determines the boundary of a region mapped in the protocol database, which is adjacent to the present region and due east of the mobile unit's 20 current location. Using the velocity component of the path of motion, a determination can be made of a future time at which the mobile unit 20 is likely to reach the future location.

According to step S350, an appropriate protocol is then selected for the mobile unit 20. This protocol is associated with the adjacent region corresponding to the determined boundary, i.e., the determined future location coordinate at which the mobile unit 20 is expected to be handed-off.

This step allows the mobile unit 20 to be notified of the selected protocol, and to prepare for the anticipated handoff. If the adjacent region corresponds to a non-serving base station 10-2 that is part of the same wireless network as the serving base station 10-1, then the selected protocol will be the same as the "present" protocol under which the mobile unit 20 is currently operating. Thus, the handoff should not affect any data sessions being conducted by the mobile unit 20 (see specification, pp. 7-8).

However, if the selected protocol is different than the present protocol of the mobile unit 20, the mobile unit 20 can prepare for the change that will occur when the handoff is performed. Step S360 illustrates such preparatory activities.

The mobile unit 20 may initiate operations according to the selected protocol (if different than the present protocol), while the mobile unit 20 is still operating according to the present protocol. Specifically, a processor in the mobile unit 20 may have both protocols running simultaneously. This step

S360 may be performed immediately after the mobile unit 20 is notified of the selected protocol, or at a time when it is determined that a handoff to a base station 10-2, whose network corresponds to the selected protocol, occurs.

At an appropriate time, or when the mobile unit 20 reaches an appropriate location, the mobile unit 20 alters its operations to use the selected protocol to perform data communications. Thus, a smooth rollover between the present protocol and the selected protocol may be performed seamlessly. This prevents a user from becoming frustrated due to a dropped call or connection, or a discontinuation of services. This also helps reduce or prevent poor service quality and prevent application lock-ups.

Because the serving base station 10-1 may similarly rely on the protocol database to initiate handoffs (as described above), the notification to the mobile unit 20 of the selected protocol is a more reliable indication of an anticipated handoff than other known methods, e.g., signal strength measurements.

In order to describe step S360 more clearly, reference will be made to FIG. 2 (Appendix D). FIG. 2 is a schematic diagram illustrating components of the mobile unit 20 according to an exemplary embodiment of the present invention. FIG. 2 is used for the purposes of illustrating a particular example where a handoff is performed between a Wavelan network and a GSM network. However, FIG. 2 in no way limits the present invention to such networks, or to any particular implementation (see specification, pp. 8-9).

As shown in FIG. 2, the mobile unit 20 includes a processor 22 that may execute applications. The processor is connected to a GPS interface 24, and two communication interfaces 26-1 and 26-2. Wavelan communication interface 26-1 is used for transmitting and receiving data according to the Wavelan protocol, i.e., the protocol associated with the serving base station 10-1 in FIG. 2. GSM communication interface 26-2 is used for transmitting and receiving data according to the protocol associated with the non-serving base station 10-2.

While the mobile unit 20 is served by the Wavelan base station 10-1, and an application executed in the processor 22 is conducting a data session with a remote host or server, the processor 22 routes data between the application and the Wavelan communication interface 26-1. This data is to be communicated between the remote host/server (not shown) and the application via the Wavelan network of the serving base station 10-1.

However, when mobile unit 20 approaches the boundary between the coverage areas of the Wavelan base station 10-1 and the non-serving base stations 10-2, the GSM protocol is selected, based on GPS signals received via GPS interface 24 (according to steps S310-S350 discussed above). The processor 22 may then initiate the GSM communication interface 26-2 to begin operating while the Wavelan communication interface 26-1 continues to operate. Thus, both protocols can be running at substantially the same time.

Thus, when mobile unit 20 is handed-off from base station 10-1 to base station 10-2, the processor 22 simply has to alter the operations of the application such that it routes data to, and processes data from, the GSM communication interface 26-2 (rather than the Wavelan communication interface 26-1). Because this involves little interruption in the data session conducted by the application, the data session can be maintained. Thus, the change between the present protocol (e.g., Wavelan) and the selected protocol (e.g., GSM) may be seamless (see specification, p.9).

As noted above, FIG. 2 is merely used for illustrative purposes only, and does not limit the configuration of the mobile unit 20, or the types or number of different networks with which the mobile unit 20 can be used.

Referring back to FIG. 3, step S370 shows that the mobile unit 20 may be configured to provide feedback to the serving base station 10-1 (both before and after a handoff occurs). For example, the mobile unit 20 may transmit measurements of received signal strength, current environmental conditions (e.g., weather) being detected, or other types of data relating to service quality

at the mobile unit's current location. Such information may be received by the serving base station 10-1 and used to update the protocol database, e.g., to update the boundaries of the coverage areas of respective base stations 10-1 and 10-2, as indicated in step S380.

VIII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL:

Appellants seek the Board's review and reversal of the Examiner's rejection of claims 1, 3, 5-12, 18, 19, 21 and 22 under 35 U.S.C. §103(a).

IX. ARGUMENTS:

A.) The Section 103 Rejections of Claims 1, 3, 5, 6, 9-12, 18 and 19

Claims 1, 3, 5, 6, 9-12, 18 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Marlevi et al., U.S. Patent No. 5,572,221 ("Marlevi") in view of Dunn et al., U.S. Patent No. 6,591,103 ("Dunn"). Appellants respectfully disagree for at least the following reasons.

Each of the remaining claims of the present invention includes the features of, among other things: (a) performing a lookup in a historical database to determine an expected path of motion for a mobile unit; and (b) determining a future location co-ordinate of a mobile unit (claim 1), or path of motion (claim 18), based on GPS data.

As the Examiner has admitted, Marlevi does not disclose the use of GPS data to determine a future location co-ordinate or path of motion. To make up for this deficiency, the Examiner relies on Dunn.

Though Dunn appears to disclose the use of GPS data, it does not appear to disclose the use of an historical database to determine a path of motion. Instead, Dunn's database (37) stores "a profile...of communication preferences and connection capabilities" (column 5, lines 34-35).

Thus, neither Marlevi nor Dunn discloses both performing a lookup in a historical database to determine an expected path of motion and determining a

future location co-ordinate of a mobile unit, or path of motion, based on GPS data. Recognizing this the Examiner has relied on a combination of Marlevi and Dunn. Such a combination is impermissible, however, because there is no motivation to combine the two references.

As the Examiner is no doubt aware, in order to combine Marlevi and Dunn a motivation to do so must be found within Marlevi or Dunn. Appellants respectfully submit that there is none.

Turning first to Marlevi, there is no motivation to combine Marlevi's "motion prediction" techniques with the GPS location features of Dunn because Marlevi does not need GPS location to carry out its predictions. Further, it appears that the algorithms in Marlevi would have to be modified to make use of GPS data; this is also impermissible (see MPEP 2143.01). In more detail, Marlevi's algorithms do not use actual position/location information. Rather, they use CDMA code numbers or TDMA cell locations. Both CDMA code numbers and TDMA cell locations indicate the cell within which a mobile operates; not the mobile's actual position/location as is the case when GPS data is used as in the claims of the present invention.

If Marlevi's algorithms were modified to use GPS data, instead of CDMA code numbers and TDMA cell locations, then the resulting paths would not correlate to cell locations or boundaries which is needed by Marlevi to compute its movement circles or movement tracks. This would, in effect, destroy the principle of operation underlying Marlevi's techniques; this too is impermissible (see see MPEP 2143.01).

As for Dunn, it does not appear to rely on historical information to determine the location of a mobile device. Thus, Dunn would appear to have no need for the "iternary patterns" stored by Marlevi.

Accordingly, because there is no proper motivation to combine Marlevi and Dunn, Appellants respectfully request that the members of the Board

reverse the decision of the Examiner, withdraw the pending rejections and allow claims 1, 3, 5, 6, 9-12, 18 and 19.

B.) <u>The Section 103 Rejection of Claims 7, 8, 21 and 22</u>

Claims 7, 8, 21 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Marlevi in view of Dunn and in further view of Yea et al., U.S. Patent No. 6,829,491 ("Yea"). Appellants respectfully disagree for at least the following reasons.

As indicated by the Examiner, the combination of Marlevi and Dunn do not disclose the step of "revising [a] protocol database based on service of quality data corresponding to [a] mobile unit." The Examiner attempts to overcome the deficiencies of Marlevi and Dunn by relying on Yea.

Appellants note, however, that each of claims 7, 8, 21 and 22 depend on either claim1 or 18 and that Yea does not overcome the deficiencies of Marlevi and Dunn raised by the Appellants above with respect to claims 1 and 18. For this reason as well as others, Appellants respectfully submit that the subject matter of claims 7, 8, 21 and 22 would not have been obvious to one of ordinary skill in the art upon reading the disclosures of Marlevi, Dunn and Yea, taken separately or in combination, at the time the present application was filed.

Accordingly, Appellants respectfully request that the members of the Board reverse the decision of the Examiner, withdraw the pending rejections and allow claims 7, 8, 21 and 22.

X. <u>CONCLUSION:</u>

Appellants respectfully request that the members of the Board reverse the Examiner's rejections and allow claims 1, 3, 5-12, 18, 19, 21 and 22.

XI. EVIDENCE APPENDIX

None.

XII. RELATED PROCEEDINGS APPENDIX

None.

Respectfully submitted,

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APPENDIX A

CLAIMS APPENDIX

1. (Currently Amended) A method for operating a mobile unit, comprising the steps of:

storing previous location and time coordinates of the mobile unit in a historical database;

obtaining a coordinate representing at least one of a current time and a current location of the mobile unit;

performing a lookup in the historical database based on the obtained coordinate to determine an expected path of motion for the mobile unit;

~~receiving signals representing a location and corresponding time coordinate of the mobile unit, the location being based on GPS data~~;

~~determining a path of motion of a mobile unit based on the received signals;~~

~~determining a future location co-ordinate based on the path of motion~~;

determining a future location co-ordinate of a mobile unit based on GPS data and the path of motion; and

selecting a protocol, for use by the mobile unit, based on the future location coordinate.

2. (Cancelled)

3. (Previously Presented) The method of claim 1, further comprising the steps of:

receiving signals representing a plurality of location and corresponding time coordinates of the mobile unit; and

determining the path of motion by calculating a direction of the mobile unit based on the plurality of location and time coordinates.

4. (Cancelled)

5. (Previously Presented) The method of claim 1, further comprising the steps of:

maintaining a protocol database associating a protocol with at least one region;

obtaining a coordinate representing a current location of the mobile unit;

determining a present region in the protocol database based on the current location of the mobile unit; and

determining the future location coordinate as a boundary of the present region in the protocol database that intersects the path of motion, wherein the boundary separates the present region from an adjacent region.

6. (Original) The method of claim 5, wherein the selecting step further comprises the step of:

selecting the protocol associated with the adjacent region in the protocol database.

7. (Original) The method of claim 6, further comprising the step of:

revising the protocol database based on service of quality data corresponding to the mobile unit.

8. (Original) The method of claim 6, further comprising the step of:

revising the protocol database based on detected changes in environmental conditions.

9. (Original) The method of claim 1, further comprising the step of:

initiating operations according to the selected protocol while substantially operating using a present protocol.

10. (Original) The method of claim 1, further comprising the steps of:

operating an application in the mobile unit to process data according to a present protocol; and

altering operations of the application to process data according to the selected protocol at a time substantially contemporaneous with the mobile unit's arrival at a location corresponding to the future location coordinate.

11. (Original) The method of claim 10, further comprising the step of:

operating the application to conduct a data session, wherein the data session is maintained while the operations of the application are altered.

12. (Original) The method of claim 9, wherein the present and selected protocols each correspond to a different communication network selected from the group consisting of at least: a wireless local area network (Wavelan) and a cellular network.

13. (Cancelled)

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Currently Amended) A base station operable to:

maintain a protocol database associating a protocol with each of at least one region;

obtain a path of motion for a mobile unit, wherein the path of motion includes a current location and a direction of the mobile unit based on GPS data, by performing a lookup of a historical database to determine the path of motion;

determine a present region in the protocol database based on the ~~a~~ current location of the ~~a~~ mobile unit; and

~~receive signals representing a plurality of location and corresponding time coordinates of the mobile unit;~~

~~obtain a coordinate representing at least one of a current time and a current location of the mobile unit, the location being based on GPS data;~~

~~perform a look-up of the historical database based on the obtained co-ordinate to determine an expected path of motion for the mobile unit;~~

determine a future location coordinate of the mobile unit as a boundary of the present region in the protocol database that intersects the path of motion, wherein the boundary separates the present region from an adjacent region.

19. (Original) The base station of claim 18, further operable to:

receive signals representing the path of motion of the mobile unit.

20. (Cancelled).

21. (Original) The base station of claim 18, further operable to:

receive signals from a mobile unit representing service quality data relating to the mobile unit's current location; and

update the protocol database based on the service quality data.

22. (Original) The base station of claim 21, further operable to:

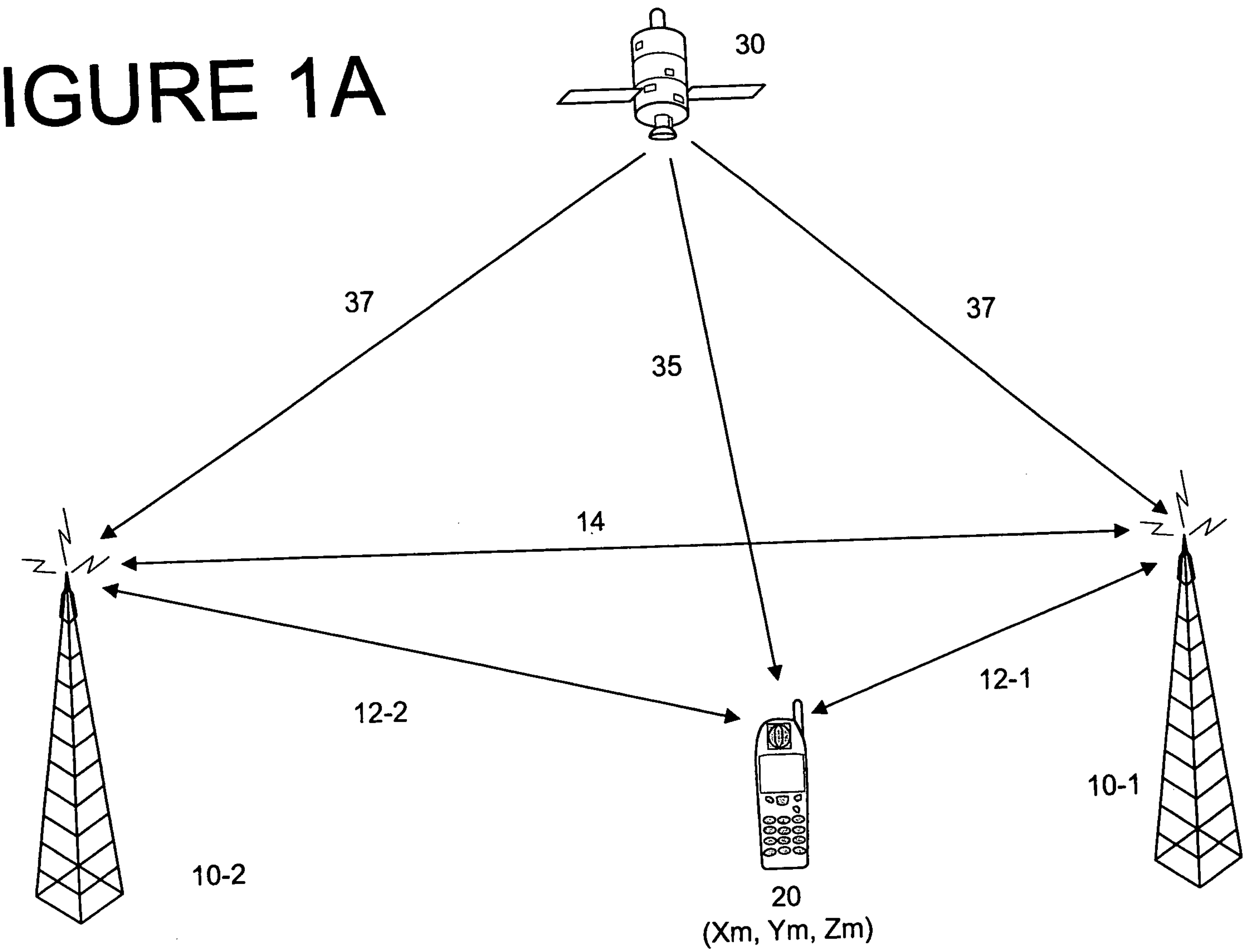
update boundaries of the at least one region in the protocol database based on the service quality data.

23. (Cancelled)

24. (Cancelled)

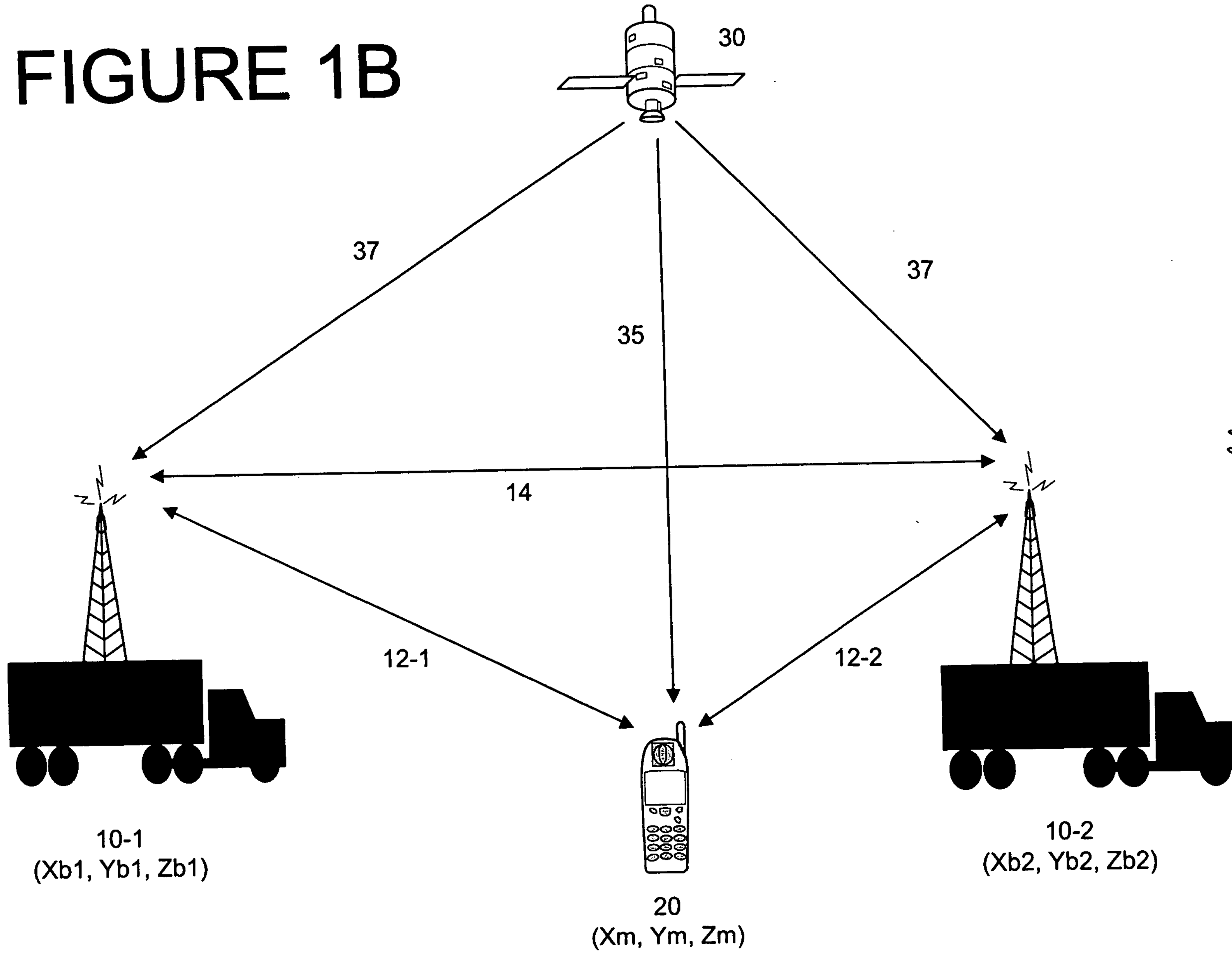
Appendix B

FIGURE 1A



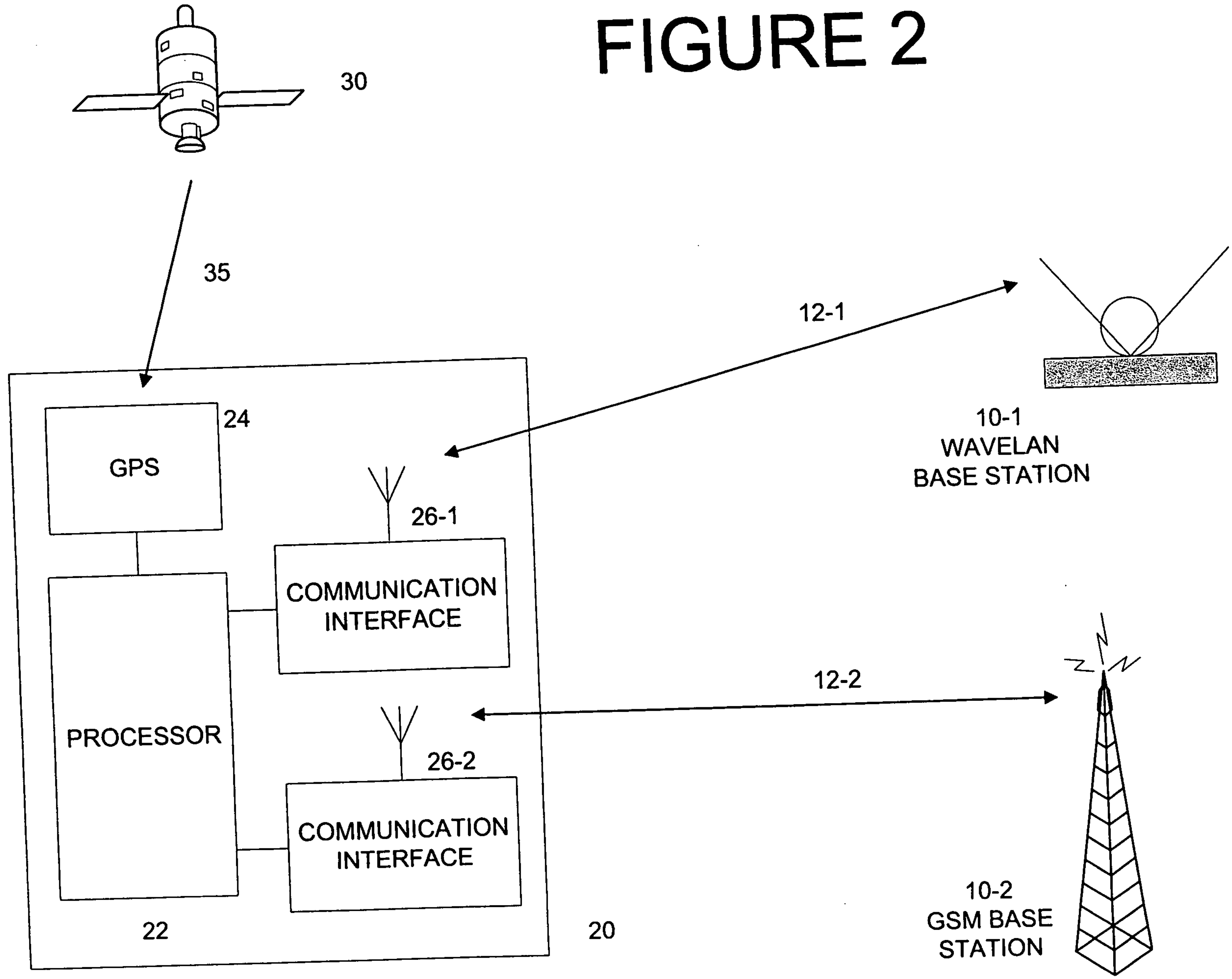
Appendix C

FIGURE 1B



Appendix D

FIGURE 2



Appendix E

FIGURE 3